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Trade in Services and Its Effects in Developing Countries

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TRADE IN SERVICES AND ITS EFFECTS IN DEVELOPING COUNTRIES

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List of abbreviations and acronyms

AfDB	African Development Bank
ARDL	Autoregressive Distributed Lag
BRICS	Brazil, The Russian federation, India, China and South Africa
CEMAC	Central African Economic and Monetary Community
CSO	Central Statistical Organization
DESTA	Design of Trade Agreements
EIA	Economic Integration Agreement
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GTAP	Global Trade Analysis Project
GVC	Global Value Chains
ICIO	Inter-Country Input Output
IMF	International Monetary Fund
OECD	Organization for Economic Co-operation and Development
PMPL	Pseudo Maximum Probability of Poisson
PSM	Propensity score Matching
UN Comtrade	United Nations Commodity Trade Statistics Database
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
VECM	Vector Error Correction Model
WTR	World Trade Report
WTSR	World Trade Statistical Review

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Abstract

In this paper, I propose to investigate the impact of trade in services (services import and services export) on the economic growth of CEMAC countries. The stylized facts on trade in services revealed that CEMAC economies are a net importer of services. Services import in value increased by about five times, while services export in value increased by about four times over the period 1987-2015. The share of services export in CEMAC GDP increased slightly from 3.21% to 3.36% during the period 1987-2015, while the share of services import in CEMAC GDP increased from 13.4% to 16.42% during the same period. The CEMAC's share in world services export and world services import decreased from 0.11% to 0.005% and 0.46% to 0.26% respectively, during the period 1987-2015. I run country and time fixed effect regression with unbalanced panel data covering the period 1987-2015. I find no impact of services export and services import on economic growth in CEMAC economies. Only other traditional determinants of economic growth such as gross fixed capital formation and government expenditure have a positive impact on economic growth. Results also point out a strong negative impact of some period (1994, 2009, and 2015) on economic growth in CEMAC economies. All these are related to specific shocks faced by CEMAC countries, which are respectively the devaluation of Franc CFA, the 2008-2009 financial crisis, and the negative oil price shock. The services export-led economic growth is not held for the CEMAC countries.

JEL Classification: F15

Keywords: trade in services, services import, services export, unbalanced panel data, CEMAC, economy growth.

1. Introduction

The tertiary sector is the third major economic sector according to the classification made by the English economist Colin Clark. This sector encompasses all economic activities that are not part of the other two major sectors (the primary sector and the secondary sector). It covers trade and service activities (tourism, education, health, telecommunication, transport, repair, finance, distribution, and so on).

Services can be classified in two types, the first category encompasses services whose production and consumption are done simultaneously, these kinds of services cannot be stored and are intangible, for instance, the service of haircut require face-to-face interaction between producer and consumer. The second category is those which do not require the simultaneous production and consumption, these kinds of services can be stored and are tangible, for example, software on a diskette does not require face-to-face interaction between producer and consumer.

Services (transport, communication, logistics, finance, and so on.) are the driving force behind Global Value Chains (GVC) because of the crucial role they play in the exchange of intermediate or finished goods across borders. Services are integrated into all value chains and the expansion of national, regional, or global value chains depends heavily on the performance and efficiency of the services sector (Lee, 2018; National Board of Trade, 2013). Goods and services are strongly interconnected in the global production process. In 2009, the share of services in the value-added of world manufacturing trade was 22.67% for mining, 30.7% for machinery and equipment, 33.01% for textiles, 33.06% for motor vehicles, 33.51% for food and 33.83% for chemicals (AfDB, OECD, & UNDP, 2014).

The well-functioning of services -accessibility at low cost and high quality- such as transport, telecommunications, financial services, and so on is a key determinant for the competitiveness of an economy. The quality of transport services has a big impact on the distribution of goods within an economy and on the ability of a country to participate in world trade. Also, a well-regulated financial sector fosters investment through the availability of savings (Li, Greenaway, and Hine, 2003).

Services contribute strongly to the economy both globally and in all categories of countries. In 2017, the share of services in Gross Domestic Product (GDP) was 67.5% at the world level,

76.1% in developed economies, 60.4% in transition economies, and 55.5% in developing economies. Among developing economies, this share was the highest in the developing economies of America (66.7%), but it was also substantial in the developing economies of Africa (53.6%) and the developing economies of Asia and Oceania (53.3%). It should be noted that over the period 2007-2017, the increase in the share of services in GDP is associated with a decrease in the share of the industry of about 3 percentage points in all categories of countries. This decline in industrial production reflects a structural transformation of the economy, which is reflected in the shift of productive resources (labor and capital) from the industrial sector to the service sector (UNCTADStat, 2019).

Nowadays the services sector is the one which provides the most jobs in the world in general but not at the same level in the group of countries. In 2018, the share of employment in services in total employment was 49% at the world level, 79% in high-income countries, and 43% in low- and middle-income countries (WTR, 2019). This highlights the fact that high-income countries are more service-intensive than low-and middle-income countries.

Today we observed a shift of employment from other activity sectors to the services sector. Indeed, over the period 2000-2015, at the world level employment decreased in the agricultural sector from 34.8% to 25.9% in the agriculture sector, while it increased in the manufacturing and services sector, from 16.9% to 18.6% and from 48.6% to 55.5%, respectively. This pattern is different among subgroups of countries. In Sub-Saharan African, the agricultural sector employed 58.5% of people in 2015 and the service sector employed only 32.3% of people in 2015, while in North America, the service sector employed 80.1% of people in 2015 and the manufacturing sector employed 18.1% of people in 2015. This points out the differential usage of labor force across groups of countries (UNCTAD, 2018).

For a long time, industrial production was the main source of income in the world in general and in developed countries in particular. Nowadays, trade in services is becoming increasingly important around the world. Indeed, improvements and innovations in information and telecommunication technologies increased the tradability of a lot of services cross-border (Baldwin, 2006; Mattoo and Stern, 2008).

According to UNCTADStat (2019), the world services export account for 25% of the total world export of goods and services, and 7% of world GDP in 2018. This small contribution of trade in services in world trade can be explained by higher trade costs observed in the services.

Indeed, the service sector faces high costs compared to other sectors of the economy. In 2017, the ratio of international to domestic trade cost was 43% higher in the services sector than in the agricultural sector (31%) and in the manufacturing sector (23%). Also, trade cost is low among advanced economies and high among emerging economies. In 2017, the ratio of international to domestic trade cost was 6.6 among emerging economies and 3.75 among advanced economies (WTR, 2019).

Developing countries are among the main actors in world trade in services. Between 2008-2018, their contribution in world trade in services increased by 5 percentage points in world export of services and by 7 percentage points in world import of services. In 2018, this share accounts for 30.9% of world services exports and 38.2% of world services imports (WTSR, 2019).

Given the increasing importance of the services sector in the economy, the question arises: what is the impact of trade in services on the economic growth of developing countries? This is the research question of our paper.

The main objective of this paper is to assess the impact of trade in services on economic growth in developing countries. In other words, we are going to investigate if trade in services leads to economic growth in developing countries and more precisely in the Central African Economic and Monetary Community (CEMAC) countries. To achieve this objective, we first present a literature review on trade in service, second we present the stylized facts on trade in services in the CEMAC countries, and third, we used an unbalanced panel data on six (06) countries which compose the CEMAC countries to estimate the impact of trade in services on economic growth in the CEMAC economies

This paper is organized as follows: **Section 2** reviews literature first on services liberalization and trade in goods, second on the interaction between trade in services and trade in goods, third on trade in services and employment, and fourth on trade in services and economic growth. **Section 3** presents some stylized facts of services trade in CEMAC countries. **Section 4** describes the methodology and data. **Section 5** presents the results of the estimation. **Section 6** provides conclusions.

2. Literature review

This section is focused on the literature review related to trade in services. In the existing literature concerning trade in services, four major issues have received attention: (1) the impact of trade services liberalization on trade in goods, (2) the interconnection between trade in services and trade in goods, (3) the effects of trade in services on employment, and (4) the impact of trade in services on economic growth.

2.1 Services liberalization and trade in goods

According to the World Trade Organization, services liberalization has a lot of benefits. It gives a suitable environment for the provision of services, allows access to a wider range of services available in the world, and fosters technology transfer through foreign direct investment.

Lee (2018) assesses the impact of services liberalization on countries' participation in gross trade and global value chains trade in goods. He employs gravity equations and more specifically investigates whether a country pair participates more in global value chain trade when it has less restricted trade in services through a regional agreement on trade in services. He uses data on 61 countries from the OECD's Inter-Country Input-Output (ICIO) database, the Economic Integration Agreement (EIA) database, and the Design of Trade Agreements (DESTA) database. He finds a positive and significant impact of services trade agreements on the export of manufacturing goods from developing countries to developed countries. His results are supported by the low cost of services links between developing and developed countries which allow developed countries to easily relocate their production to developing countries to benefit from a low variable cost. On the other hand, trade barriers are high among developing countries and so services liberalization could increase trade flow amongst them.

Similarly, using micro-data on firms in the Czech Republic for the period 1998-2003, **Arnold, Javorcik, and Mattoo (2011)** investigate the impact of services liberalization on the performance of manufacturing firms. They collect firm-level data from the Amadeus database and the European Bank for Reconstruction and Development publication. Running semi-parameter estimation technique with a firm and year fixed effects, they find a positive impact of services industries liberalization on the productivity of manufacturing firms that use services inputs. The key channel which supported this result was the openness of service sectors to Foreign Direct Investment (FDI) in services. They further find a significant increase in sales and labor productivity of firms due to the presence of FDI.

In the related context, **Su, Anwar, Zhou, & Tang (2020)** assess the impact of trade in services restriction on the sophisticated manufacturing export. Running fixed effect panel regression with data from 36 countries (31 OECD and 5 major non-OECD economies) over the period 2005-2014, they find a negative and significant impact of trade in services restriction on the sophisticated manufacturing export. The key channel which supports their result is the restrictions on trade in services which led to limited supplies in sophisticated services needed to produce high-tech manufacturing goods for firms that require high-tech services inputs.

In sum, generally, liberalization in one sector of the economy increases competition in that sector due to the increase in the number of providers which then allows users to benefit from a wider range of products of that sector. It also allows for a high quality of products due to the competition.

These studies point out two channels through which services liberalization impact positively trade in goods. The first is through offshoring of some stages of production to a destination where firms have an advantage of low variable cost and low fixed organization cost. This is more profitable for developing countries where we have a low variable cost. The second is through the availability and high quality of services to a wider number of firms which allow them to be more productive and then increase their production. Indeed, services are useful for all stages of the goods production process.

2.2 Interaction between trade in services and trade in goods

A set of firm-level empirical evidence has analyzed the possible interconnection between trade in services and trade in goods. These studies showed that exporting goods and services in the same destination, raises the sales of goods, due to the modification of the perceived quality of goods sold by the consumer.

Ariu (2016a) uses descriptive statistics to compare trade in services and trade in goods at a firm-level. He collects data over the period 1995 to 2005 from the National Bank of Belgium database and the Business Registered. He finds low participation and a small contribution of firms that trade only services in world trade and a small survival probability among them, compared to firms that trade only goods. While for firms which trade both goods and services, he finds low participation, and a high contribution in world trade -even if their main export or import remains goods-, and a high survival probability among them. He explains the low participation of Belgian firms in trade in services by high fixed costs like market restriction in the telecommunication sector and variable costs like the obstacle to the free movement of

persons due to the visa requirement, which discourages some firms to involve in this sector. In a dynamic perspective, he finds a shifting of firms from trading only goods or services to trading both goods and services and a lack of heterogeneity between firms involved in trade in services and those involved in trade in goods.

In addition, **Ariu, Mayneris, and Parenti (2020)** investigate the effect of services provision on goods export performance of firms exporting both goods and services (bi-exporters). Running instrumental variables strategy with firm-level data from the National Bank of Belgium and the Business Registered, over the period 1997-2005, they find that compared to firms which export only goods (mono-exporters), bi-exporters export a higher quantity of goods and sell more goods at a higher price to locations where they also supply services than to locations where they do not. Using the oligopolistic competition model, they show that services act on the perception of the quality of bi-exporters' goods. Then, selling goods and services in the same foreign destination market is beneficial for trade in goods.

Comparing the impact of the 2008-2009 financial crisis on exports of services and on exports of goods**, Ariu (2016b)** uses a difference-in-difference strategy with firm-level data over the period 2006-2010 from the National Bank of Belgium database, the Business Registered, the IMF World Economic Outlook database, and the European Central Bank's Statistical Data Warehouse. He finds a differential elasticity of services with respect to GDP growth compared to goods during the crisis - export in services was not affected by the crisis, while export in goods was. He attributes this difference to the fact that durable and capital goods which constitute a sizable part of goods export, decreased during the crisis, while services and consumables goods which represent the main share of GDP, increased during the crisis. Among types of services, he further finds a decrease only in transport services flows, and a sharp increase in flows of other services (financial, telecommunication and business services) during the crisis.

Firm-level studies in Belgium show low participation of firms in trade in services and a high contribution of firms which trade both goods and services. The same patterns were observed in other developed countries. Breinlich and Criscuolo (2011) find low participation of United Kingdom (UK) firms in trade in services, a firm-level heterogeneity (in terms of size, productivity, and capital intensity) across services exporters and many similarities between trade in services and trade in goods. Federico and Tosti (2017) find for Italian firms that one-third of total services export come from firms that also sell goods. Kelle and Kleinert (2010)

found that for German firms 25% of the services export is done by firms that also export goods. Crozet and Milet (2017) find for French firms that a larger number of manufacturers sell both goods and services in foreign markets. This means that the phenomenon of trading goods and services together by firm is not country specific in developed countries.

So, the fact that firms which trade both goods and services in the same destination increase their sales in goods compared to firms which sell only goods, meaning that services seem to be a key determinant of the vertical differentiation of goods or products. Thus, trading also services could be a new growth path for firms which trade goods.

However, we do not find any firm-level evidence for developing countries in the literature.

2.3 Trade in services and employment

The theory based on "factor proportion arguments" and on "firms' hierarchies" suggest that developed countries should specialize in high skill-intensive activities while developing countries should specialize in low skill activities (Bhagwati et al., 2004; Deardorff, 2005; Markusen, 2005; Markusen and Strand, 2007, Antras et al., 2006, 2008). Hence, it is beneficial for developed countries to offshore activities which are low skill-intensive to countries characterized by low skill employment and low wage. Offshoring allows firms to be more efficient by relocating the inefficient part of their production process which requires low skill to another country, where labor is cheaper.

Services offshoring started taking place in the 1970s and it is increasing over time due to the improvement in telecommunication and the substantial reduction of trade barriers observed in the last 50 years. But, since the 1990s workers in developed countries fear about their jobs due to the phenomenon of services offshoring. A couple of studies since the 2000s investigate the effects of trade in services on employment more specifically the effects of services offshoring on employment. These studies addressed two issues, one group focused on the effect of services offshoring on total employment, and the second group focused on the effect of services offshoring on employment composition.

2.3.1. Effects of services offshoring on employment

The effect of services offshoring on employment in the literature is ambiguous. Some studies find a negative and significant effect, other a positive effect, and other no effect of services offshoring on employment.

Amiti and Wei (2005) assess the effect of services and material offshoring on employment in the United Kingdom. They use a panel of 78 industries (69 manufacturing industries and 9 services industries) over the period 1995-2001. Running a log-linear labor demand equation, in manufacturing sector employment, they find a positive and significant effect of services offshoring on employment in first difference estimation and a positive and insignificant effect of services offshoring on employment in long difference estimation. In services sector employment, they find no robust negative and significant effect of services offshoring on employment. Indeed, for first difference estimation, they find a negative and significant effect of services offshoring on services sector employment, while for long difference estimation, they find a positive and significant effect of services offshoring on services sector employment.

A related study by **Amiti and Wei (2006a)** investigate the effect of services offshoring on the United States manufacturing industries' employment. They collect data on 450 manufacturing industries over the period 1992-2000. Estimating a log-linear labor demand equation, they find a negative and significant effect of services offshoring on employment. When they aggregate 450 manufacturing industries to 96 industries, they find no effect of services offshoring on employment in manufacturing industries. Similarly, **Gorg and Hanley (2005b)** use plant-level data on 100 Irish Electronics industry over the period 1990-1995, to assess the effect of services offshoring on labor demand. Estimating Generalized Method of Moments, they find a negative and significant effect of services offshoring on labor demand.

In contrast, **Eppinger (2019)** assesses the impact of service offshoring to cheaper labor countries on firm employment in Germany. He used data on 26,000 firms over the period 2001-2013 from the Statistics on International Trade in Services (SITS), the Corporate Balance Sheet Statistics (USTAN), and the Microdatabase Direct Investment (MiDi). Using Instrumental Variables strategy, he finds a positive impact of service offshoring on firm employment in Germany. The channel through which service offshoring has increased firm employment in the Germany, is the fact that relocation enables firms to reduce their production costs by paying low wage in offshoring countries which lead to an increase of firm savings, and then firms can recruit more workers in Germany. Also, employment gains increase with the initial level of firm service relocation.

2.3.2. Effect of services offshoring on the composition of white-color employment

The effect of the relocation of services on the composition of employment is ambiguous. Some studies find that services offshoring increases the employment of high skill workers and reduce the employment of low skill workers while other studies find the reverse.

Crinò (2007a) assesses the effects of services offshoring on white-collar employment in United States firms. Estimating Quasi-Maximum Likelihood with a panel of 144 industries over the period 1997-2002, he finds services offshoring increases employment amongst high-educated professions and decreases employment amongst medium- and low-educated occupations. Similarly, **Crinò (2007b)** investigates the effect of services offshoring on the skill composition in labor demand in nine Western European countries (Austria, Finland, Germany, France, Italy, Netherlands, Spain, Sweden, United Kingdom). He collects country-level data on 20 manufacturing and services industries over the period 1990-2004. Using an instrumental variables strategy, he finds a positive and significant effect of services offshoring on high-skilled workers and a negative and significant effect of services offshoring on medium- and low-skilled workers.

In a related study, **Crinò (2010a)** assesses the effect of services offshoring on the level and composition of employment in Italian firms. He used a Propensity Score Matching (PSM) strategy with data on 4111 Italian firms over the period 2001–2003 from the 9th 'Indagine sulle Imprese Manifatturiere'. He finds no effect of services relocation on the level of domestic employment but a shift in the composition of domestic employment in the direction of highly educated workers. Similarly, **Crinò (2010b)** investigates the effect of services offshoring on white-collar employment in United States industries. Estimating log-linear labor demand equation with data on 144 industries cover the period 1997-2006, he finds that services offshoring increases employment more in skilled jobs and less in low skilled jobs.

In addition, **Ariu, Hakkala, Jensen, and Tamminen (2019)** study the impact of the change in employment composition on the performance of Finnish importers of services over the period 2002-2012. Estimating a panel fixed effect with firm-level data, they find that, the increase in services input import is associated with the shift towards skilled employment translating by a reduction in employment of low-skill workers and an increase in employment of high-skilled workers. They also find an increase in sales, assets, services exports, and firms' survival.

In contrast, **Ornaghi, Beveren, and Vanormelingen (2017)** study the impact of goods and service relocation on employment in Belgium firms. They collect firm-level data from the National Bank of Belgium cover the period 1996-2005. Using Instrumental Variables strategy, they find a negative impact of services relocation on employment growth amongst high skilled workers in the service sector and a positive impact of goods relocation on employment growth amongst low and high skilled workers in the manufacturing sector. They attribute the negative effect of service offshoring on employment growth to the low level of service relocation during the period of study.

In sum, offshoring of services is beneficial for both the offshoring country and the host country. The offshoring country gains in terms of reduced production costs due to low wages while the host country gains in terms of job creation, technology transfer. Empirical findings of the effect of services offshoring on overall employment and employment composition are not consensus. Some studies find a negative impact of services offshoring on overall employment while other studies find the reverse. Also, some studies find an increase of high skill employment and a reduction of low skill employment due to services offshoring, and other studies find the reverse.

It is not surprising that all these studies are done in developed countries since developed countries have a comparative advantage in term of offshoring. Developing countries in the most of time are the host countries of offshoring.

2.4 Trade in services and economic growth

Some studies focused on the impact of trade in services on economic growth. These studies addressed two issues: one set of studies focused on the impact of trade in services on economic growth, and other sets of studies focused on the trade in services liberalization in the financial and telecommunication sector on economic growth.

2.4.1. Impact of trade in services on economic growth

Dash and Parida (2012) assess the effect of trade in services in the economic growth of India during the post-reform period. They collect quarterly data cover the period 1996-2011 from the Central Statistical Organization (CSO), Government of India and from Handbook of Statistics, Reserve Bank of India. Running Autoregressive Distributed Lag (ARDL) model and Vector Error Correction Model (VECM), they find a long-run equilibrium relationship amongst GDP, services exports, services imports, and real effective exchange rate. They also find a

unidirectional causality from services exports growth to GDP growth, pointing out that services export-led growth in India during the post-reform period.

In a related context, using annual times series data from the UNCTAD database over the period 1984-2013, **Priyankara (2018)** investigates whether the Export-Led Growth Hypothesis (ELGH) in the case of services export is held for Sri Lanka. Running Granger no-causality test, he finds a unidirectional causality from services export to economic growth in Sri Lanka.

Similarly, **Khatun (2016)** investigates the relationship between trade in financial services and economic growth in BRICS economies. Using Pedroni's panel cointegration approach with data covering the period 1990-2012, from the International Monetary Fund (IMF) balance of payment (BOP) database and the World Bank database, he finds a long run relationship between trade in financial services and economic growth in BRICS economies. He also finds both short run and long-run unidirectional causality from trade in financial services to economic growth in BRICS countries.

In addition, **Sermcheep (2019)** investigates the impact of services export on economic growth in ASEAN countries (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam). He uses data on a panel of ASEAN countries over the period 1980-2014. Running Instrumental Variables strategy, he finds a positive and significant effect of total services export on GDP growth, also when he decomposes services export into modern services (Insurance and pension services, Financial services, Charges for the use of intellectual property n.i.e., Telecommunications, computers, and information services) and traditional services (Manufacturing services on physical inputs owned by others, Maintenance and repair services n.i.e., Transport, Travel, Construction, Personal, cultural, and recreational services, Government goods and services) export and runs the regression, he finds a positive effect of both on GDP growth with a stronger effect from the traditional services export.

Similarly, **Mishra, Lundstrom, and Anand (2011)** use data on 103 countries over the period 1990-2007, to assess the impact of high-end services export on economic growth. Estimating Generalized Method of Moments (GMM), they find a positive effect of high-end services export on economic growth, especially in low-and middle-income countries.

Using instrumental variables with a panel of time series data on 82 countries over the period 1985-1999, **Li, Greenaway, and Hine (2003)** investigate the impact of services import and manufacturing goods import on economic growth. They find a negative impact of the import of

services on economic growth in developing countries and a positive impact in developed countries. In a related study, **Gabriele (2006)** studies the relationship between services export and GDP growth in developing and transition economies. He uses data on 114 countries over the period 1980-2000. Running regression, he finds a positive impact of services export on GDP growth, but the impact is small in developing economies than in transition economies.

2.4.2. Impact of liberalization of financial and telecommunication sector on economic growth

El Khoury and Savvides (2006) study the impact of trade in services (telecommunication and in financial) openness on economic growth. They use a cutoff regression model. They collect data a panel data on 67 countries over the period 1990 – 2000 from the World Development Indicators (WDI) database. They consider the initial income per capita like cutoff variable under the hypothesis that the impact of opening up trade in services on a country's economic growth depends on its level of development (measured by income per capita). They find a positive and significant effect of the openness in telecommunication on growth, for low-income countries and a positive and significant effect of the openness in the finance sector on growth, for high-income countries. In the reverse, they find no effect of the openness in telecommunication on growth, for high-income countries and no effect of the openness in finance on growth for low-income countries.

Mattoo, Rathindran, and Subramanian (2006) study the impact of trade in service liberalization in financial and telecommunication sectors on economic growth. Estimating cross-country regression with a panel of time series data on 60 countries over the period 1990-1999. They find a strong positive impact of financial sector liberalization on economic growth and a weak positive impact of telecommunication liberalization on economic growth.

To sum up, a set of empirical evidence found a positive impact of services export on economic growth. Another set of studies found a positive impact of the liberalization of financial and telecommunication sectors on economic growth. Most of this evidence is shown for developing countries. Then the export of services and the liberalization of the financial and telecommunication sectors could be the new engine of long-run growth in developing countries.

Empirical evidence on trade in service reveals the following conclusion:

- at the country level, services liberalization has a positive impact on trade in goods. Trade in services, and liberalization of financial and telecommunication sector have a positive impact on economic growth;
- at firm-level trade in services has a positive effect on trade in goods, and an ambiguous effect on employment and the composition of employment. Indeed, some studies find a negative effect of services offshoring on employment while other studies find the reverse. Also, some studies show that services offshoring tend to increase of employment of high skilled workers and reduce employment of low and middle-skilled workers, while other studies find the reverse.

In this paper, we are going to focus on the impact of trade in services on economic growth. The case study chosen is the CEMAC countries which are composed of Cameroon, Central African Republic, Congo Republic, Chad, Equatorial Guinea, and Gabon.

3. Stylized facts of services trade in CEMAC countries

This section has two goals: (1) investigate the importance of service sector in CEMAC economies and (2) point out the performance of trade in services and its composition in CEMAC countries. Data used for this purpose come from different sources: World Development Indicator (WDI) database, United Nations Conference on Trade and Development (UNCTAD) database, and United Nations Commodity Trade Statistics (UN Comtrade) database.

3.1. Importance of service sector

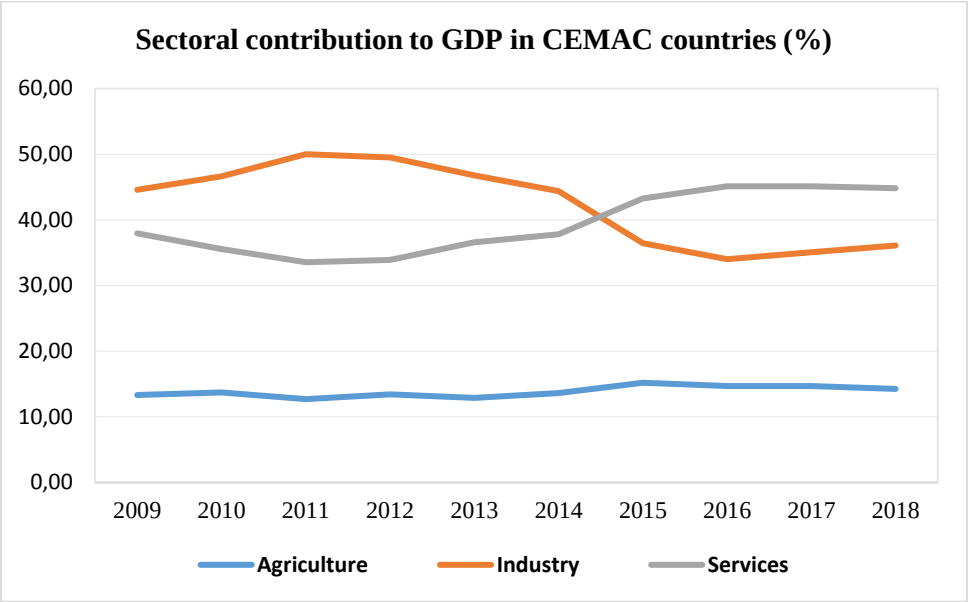
3.1.1. Sectoral growth performance

Services and industry are the main sectors which contribute to CEMAC's GDP. Since 2011, the share of the services sector to GDP increased sharply from 33.55% in 2011 to 44.34% in 2018 at the expense of the industry sector which decreased sharply from 50% in 2011 to 36.1% in 2018 (figure 1). This reflects a structural transformation of the CEMAC economies to a service orientation.

The change in sectoral growth for CEMAC's economies shows that service sector increased on average at 18.44% per annum during the 1970s, grew to 5.83% per annum during the 1980s, decreased to 1.75% per annum during the 1990s, increased to 13.22 % per annum during the 2000s and increased to 4.85% during 2010-2018. Compare to the other sector, services are the one which displays a higher average growth rate during the period 2010-2018. During this period the agriculture sector grew on average at 2.39% per annum while the industry sector increased on average at 0.2% per annum (figure 2).

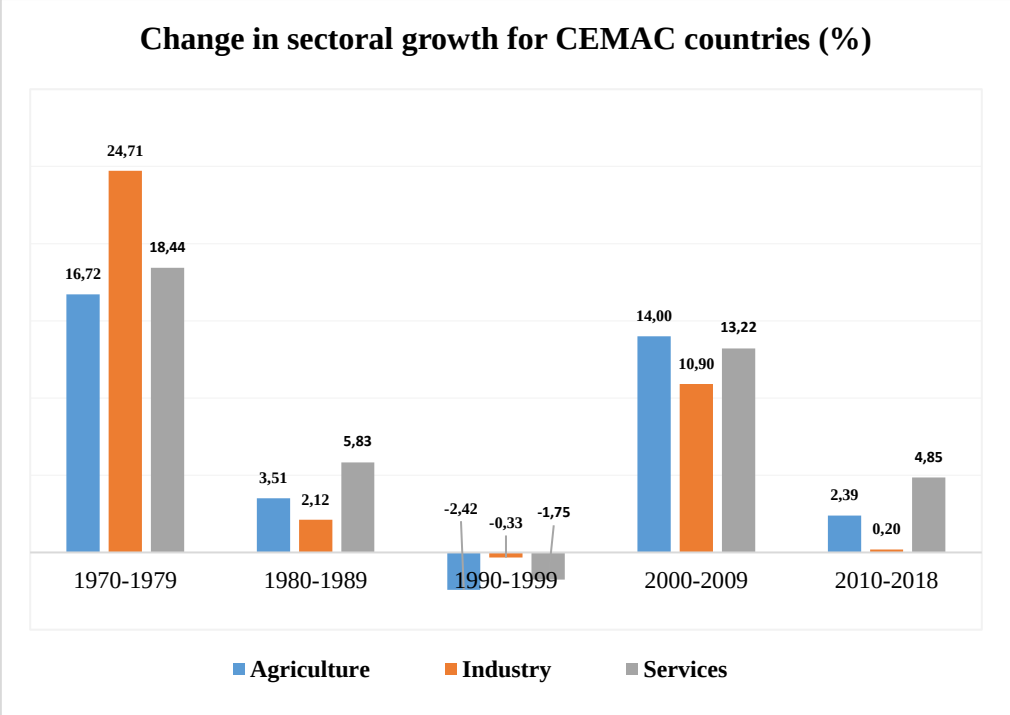
Among the CEMAC countries, in 2018, Cameroon is the major contributor in all sectors in this region. His contribution accounts for 47.53% to the service sector, 41.7% to the agriculture sector and 29.47% to the industry sector. This points out that Cameroon is the main driver of the CEMAC economy. Concerning the service sector, the other main contributors are Gabon (16.30%) and Equatorial Guinea (13.17%). However, the Central African Republic is the one which contributes the less to service sector in CEMAC economies, his contribution accounts for 2.22% (figure 3).

***Figure 1* : Evolution of sectoral contribution to CEMAC's GDP (%)**



Source *: Author's calculation with WDI data*

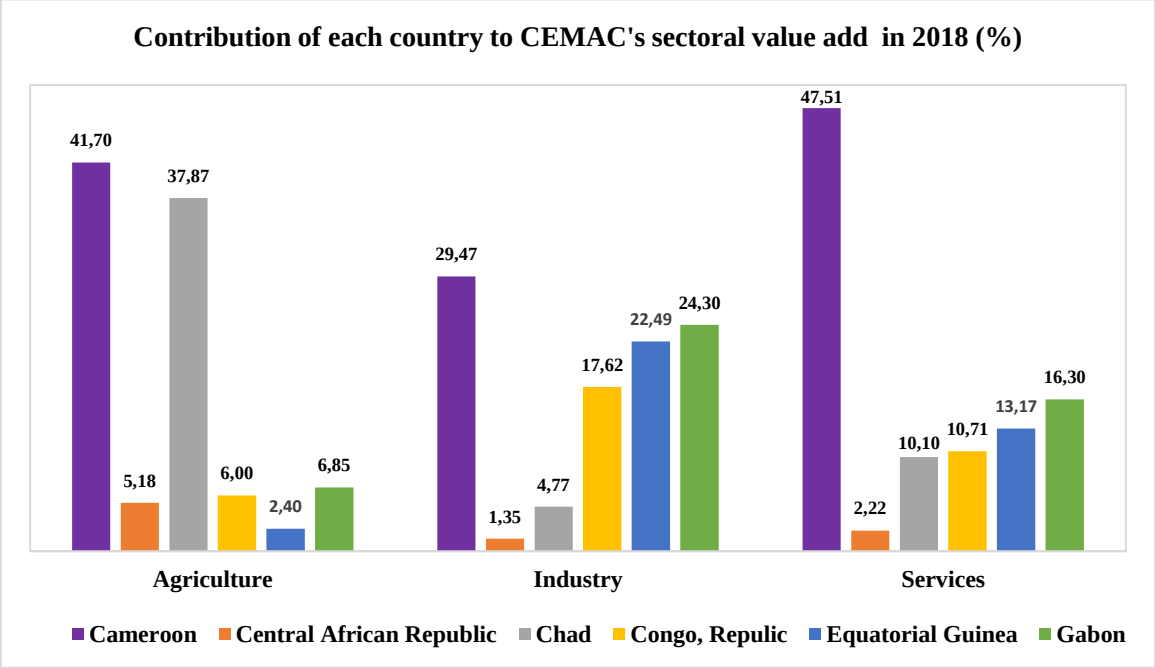
***Figure 2* :: Change in sectoral growth for CEMAC countries (%)**



Source: *Author's calculation with WDI data*

Note: We compute the change in sectoral growth for CEMAC countries only with 4 countries (Cameroon, Chad, Congo Republic, and Gabon) because data are not available for the Central African Republic and Equatorial Guinea on the period 1970-2008.

***Figure 3** : Contribution of each country to CEMAC's sectoral value add in 2018 (%)*



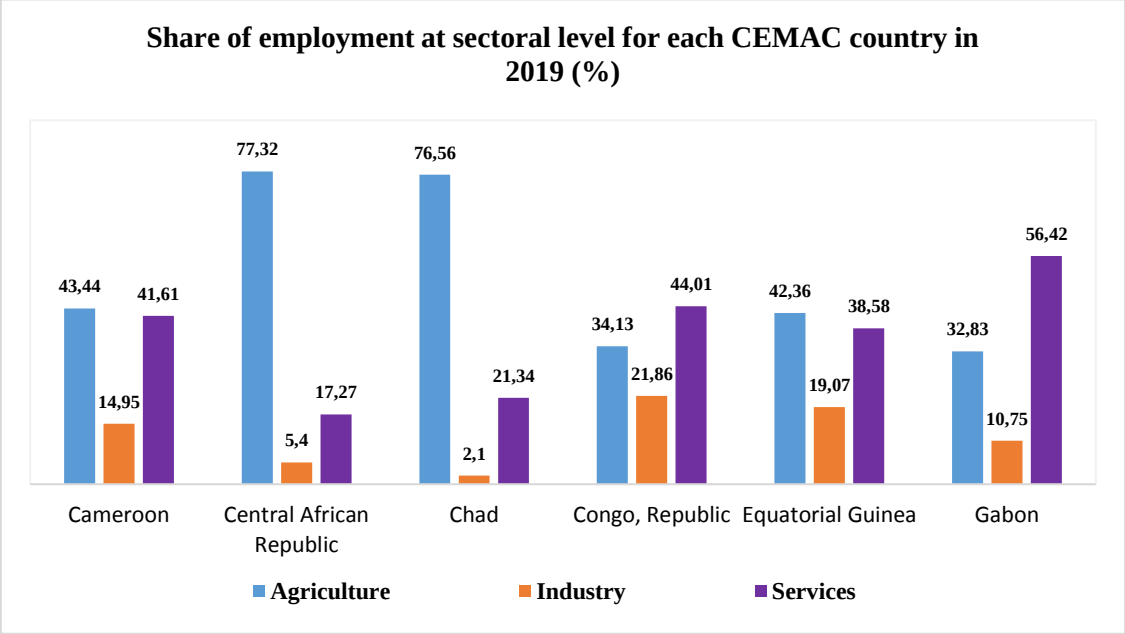
***Source** : Author's calculation with WDI data*

3.1.2. Employment performance in CEMAC countries

Among CEMAC countries, in 2019 in the services sector two countries have the highest share of employment: Gabon (56.42%) and the Congo Republic (44.01%). While in the agriculture sector, countries which provide the most share of employment are the Central African Republic (77.32%) and Chad (76.56%). In Cameroon, the most share of employment is distributed between the agricultural sector and services sector, accounting for 43.44% and 41.61%, respectively to total employment. For all CEMAC countries, the industry sector is the one which employs less, especially in Chad (2.1%) and in the Central African Republic (5.4%) (figure 4).

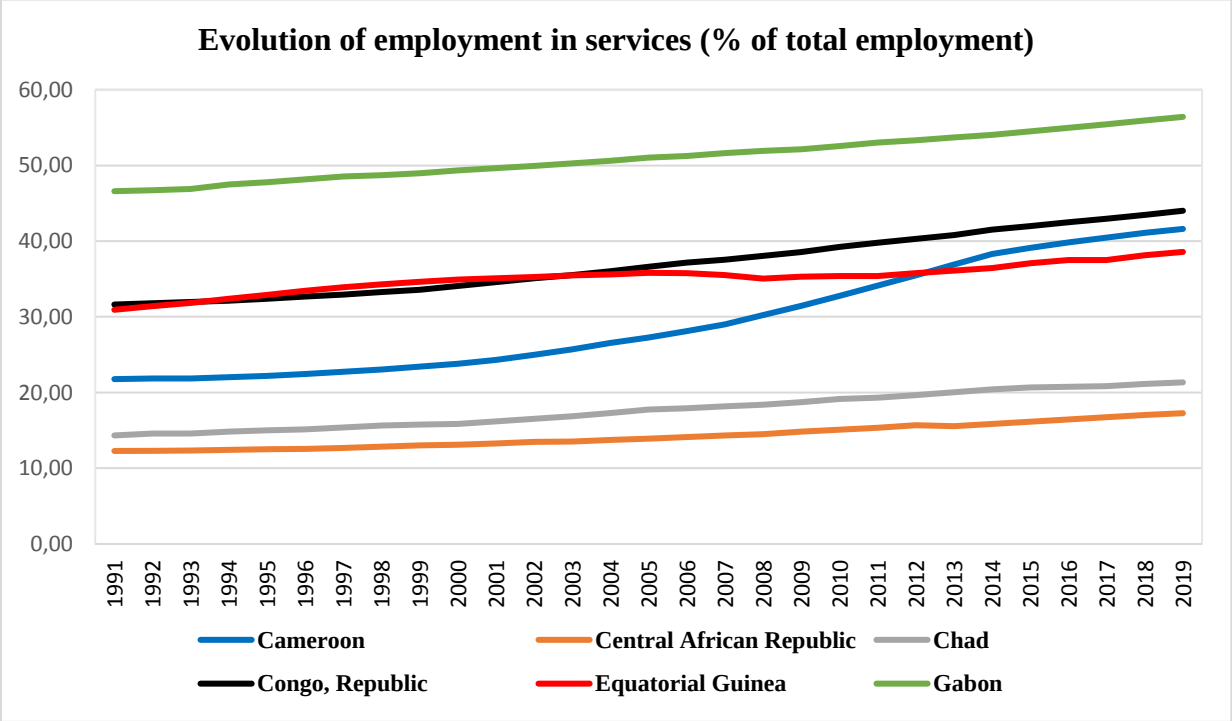
Figure 5 shows the evolution of employment in services for each CEMAC country in the period 1991-2019. We observe an increase of the share of employment during this period in all countries. However, the growth is different from one country to another. In Cameroon the share of employment in the service sector to total employment has doubled during the period, it increased from 21.77% in 1991 to 41.61% in 2019. While the increase was at 12.48 percentage point in the Congo Republic, 9.82 percentage point in Gabon, 7.65 percentage point in Equatorial Guinea, 7 percentage point in Chad, and 5.19 percentage point in the Central African Republic during the period.

***Figure 4** : Share of employment at the sectoral level for each CEMAC country in 2019 (%)*



***Source** : Author's calculation with WDI data*

***Figure 5** : Evolution of employment in services for each CEMAC country (% of total employment)*



***Source** : Author's calculation with WDI data*

3.2. Trade in services performance

3.2.1. Services trade performance at the global level

The evolution of services export and import reveals that CEMAC economies are a net importer of services and the gap between service import and service export become more and more widespread since the 2000s. Both import and export of services increased over the period 1987-2015. The CEMAC services import in value have risen from US$ 2.729 billion in 1987 to US$ 13.078 billion in 2015, increased by about 5 times, while services export in value have risen from US$ 0.652 billion in 1987 to US$ 2.675 billion in 2015, increased by about 4 times (figure 6).

However, across the sub-period, the average growth of services import, and services export are not similar. Services import decreased on an average at 0.13% per annum during the 1990s, increased to 12.79% per annum during the 2000s, and further increased at 0.31% per annum during the period 2010-2015. While services export grew on an average at 1.67% per annum during the 1990s, increased to 10.3% per annum during the 2000s, and further increased to 5.28% per annum during the period 2010-2015. We can notice that the 2000s was the period of fast increase of both import and export of service in the CEMAC economies (figure 7).

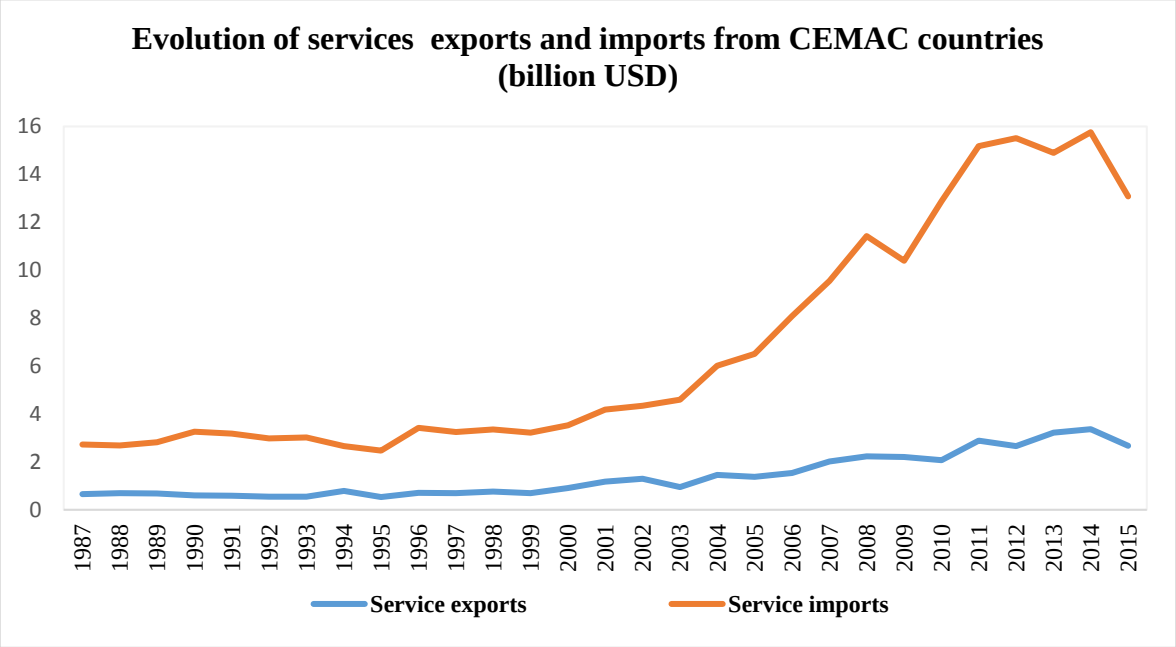
Services export share in CEMAC's GDP was quite stable from 3.21% to 3.36% during the period 1987-2015 and his highest share to GDP was 5.26% in 2001. While services import share in CEMAC's GDP evolved in a sawtooth shape over the period, its share increased first from 13.42% in 1987 to 18.75% in 2001, after decrease to 13.40% in 2008 and increased again up to 16.42% in 2015 (figure 8).

Similarly, CEMAC's share in world services export decreased sharply from 0.11% in 1987 to 0.04% in 1995 and became stable to the range of 0.04% - 0.08% over the period 1995-2015 to end up at 0.05% in 2015. While CEMAC's share in world services import evolved in a sawtooth shape, it decreased sharply from 0.46% in 1987 to 0.20% in 1995, after rose to 0.36% in 2012 and decreased again up to 0.27% in 2015 (figure 9).

Amongst the CEMAC countries, Cameroon is the largest services importer of this region, his imports account for 51.34% of total CEMAC services import in 2015. Other major services importer in the region are Congo and Chad which contribute at 13.55% and 12.40%, respectively. Regarding, services export, Congo is the biggest services exporter from this region, his exports account for 28.42% of total CEMAC's services export in 2015. Other dominant services exporter are Chad, Equatorial Guinea and Cameroun and their flows account

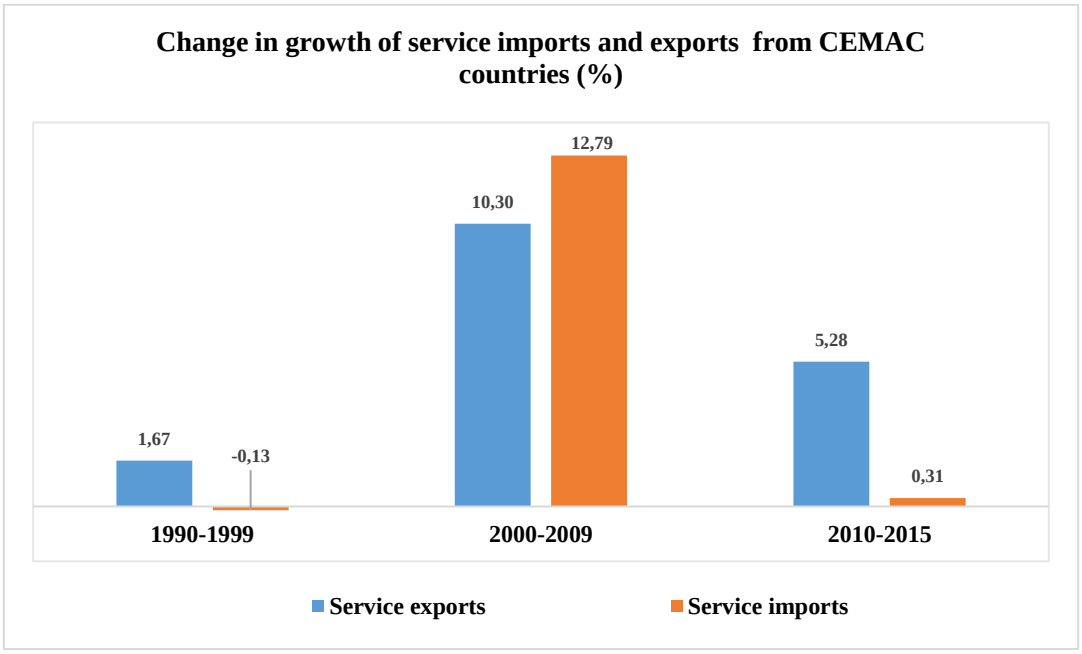
for 21.11%, 13.66%, and 16.80% respectively. The Central African Republic is the one which contributes less both in service export (1.65%) and services import (3.94%) in this region (figure 10).

***Figure 6** : Evolution of value of services export and import from CEMAC countries*



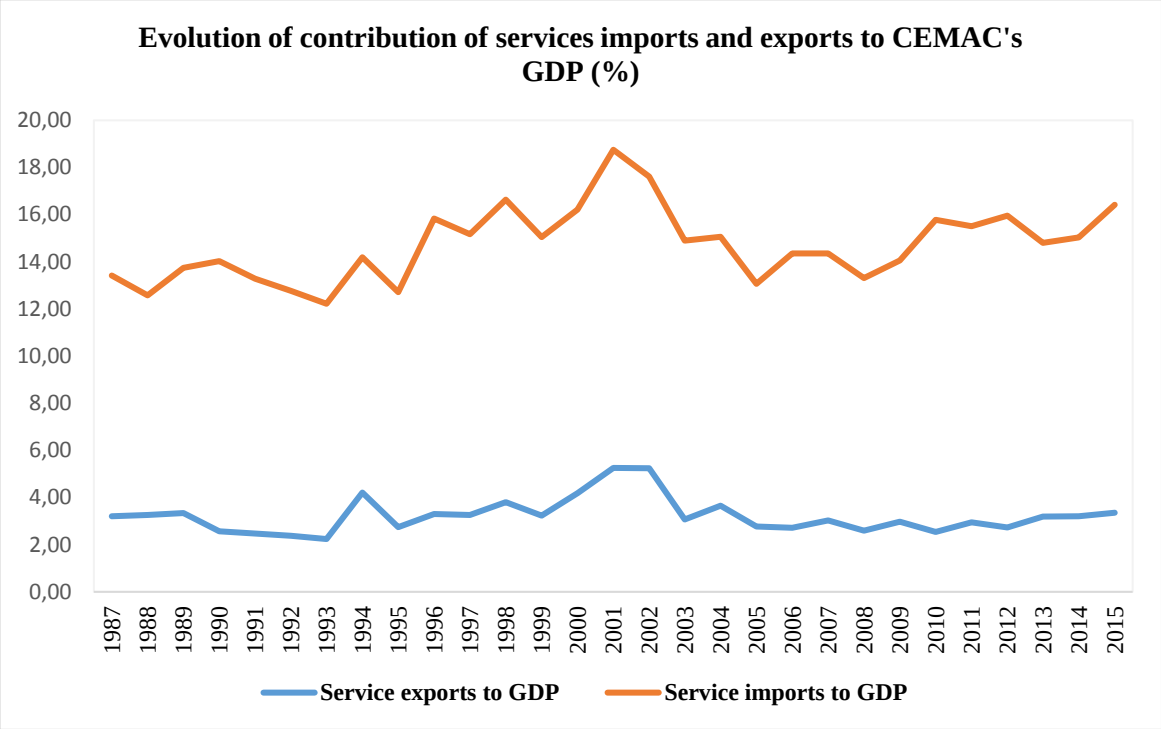
***Source** : Author's calculation with UNCTAD and UN Comtrade data*

***Figure 7** : Change in the growth of service imports and exports from CEMAC countries (%)*



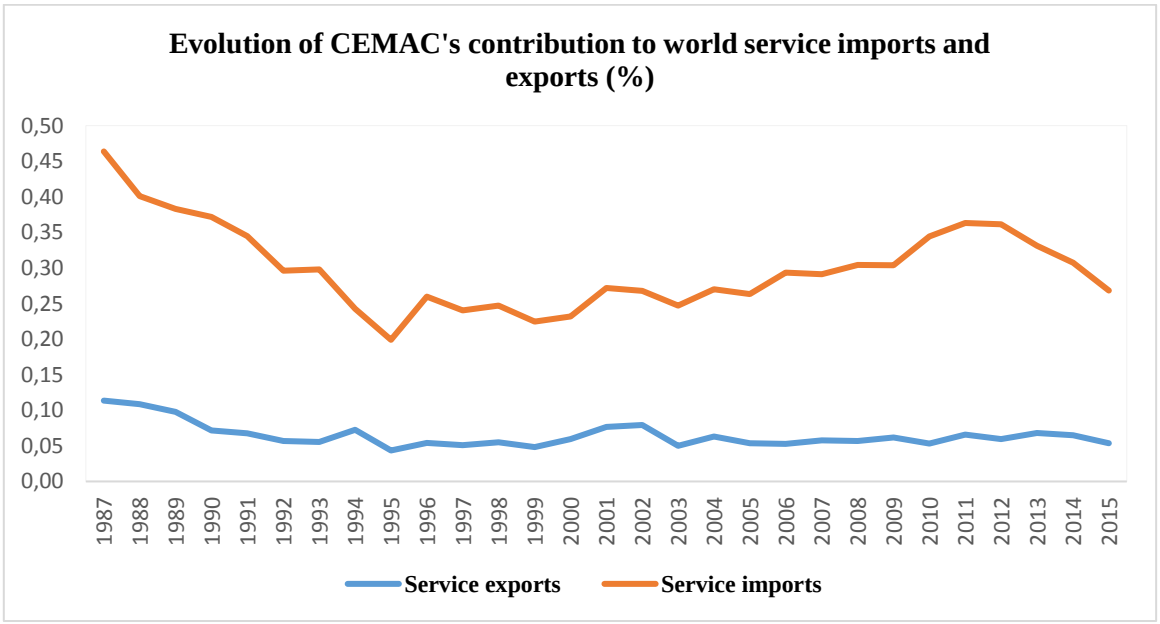
***Source** : Author's calculation with UNCTAD and UN Comtrade data*

***Figure 8** : Evolution of contribution of services imports and exports to CEMAC's GDP (%)*



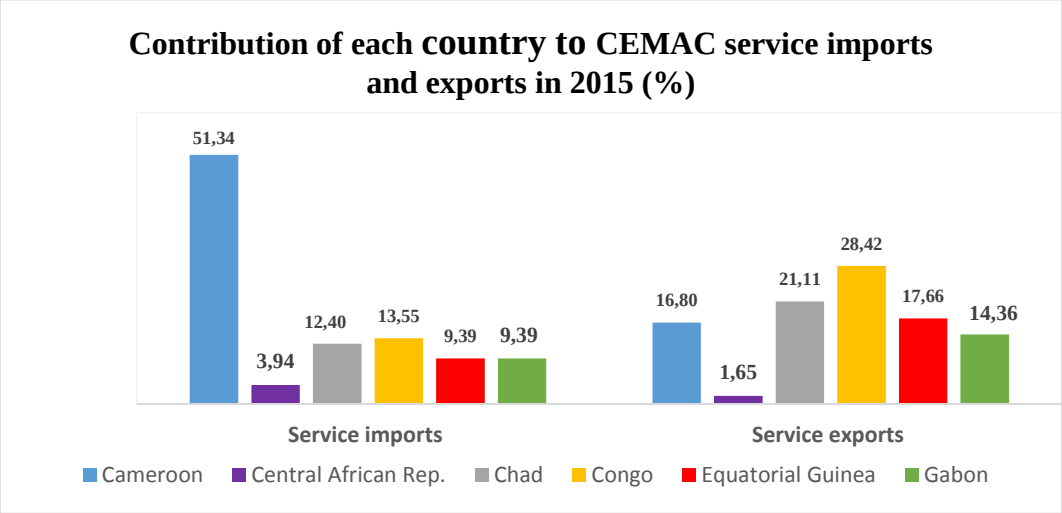
***Source** : Author's calculation with UNCTAD and UN Comtrade data*

***Figure 9** : Evolution of CEMAC's contribution to world service imports and exports (%)*



***Source** : Author's calculation with UNCTAD and UN Comtrade data*

***Figure 10** : Contribution of each country to CEMAC's service imports and exports in 2015*



***Source** : Author's calculation with UNCTAD and UN Comtrade data*

3.2.2. Services trade performance at sub-category level

The sub-category of commercial services presented in this paper is the one considered by the World Bank. It regroups services in four sub-categories: travel services; transport services; insurance and financial services; and computer, communication, and other services. The composition of each sub-category is provided in annex 1.

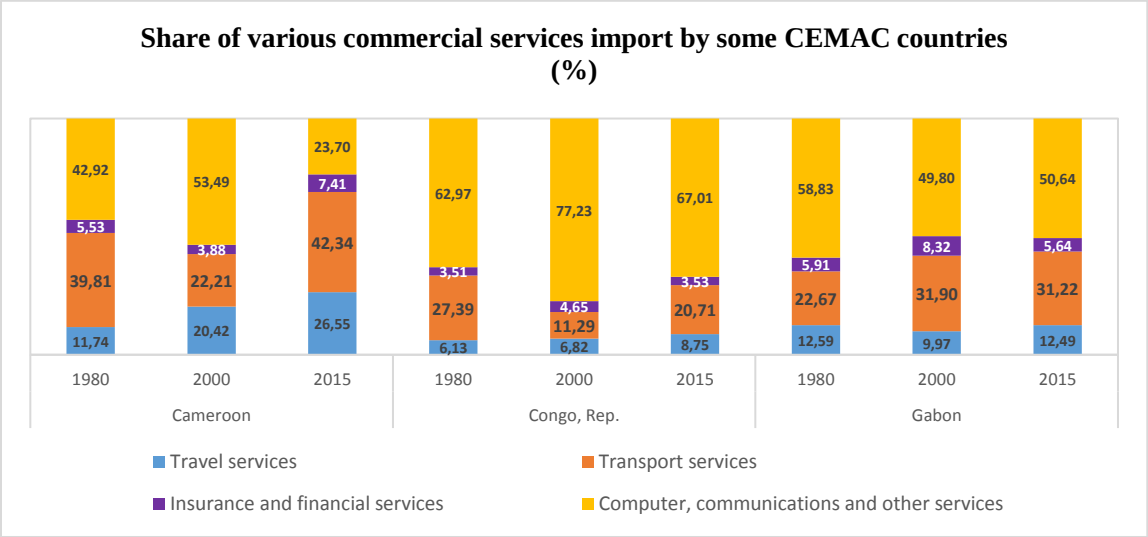
Concerning import, out of the four sub-categories of commercial services, transport represents the largest share of import in Cameroon, accounting for 42.34%, while computer, communication and other services represent the largest one in the Congo Republic and Gabon accounting for 67.83% and 50.64%, respectively in 2015[1]. Insurance and financial services is the residual component of services import of three countries, accounting for 7.41% in Cameroon, 3.53% in the Congo Republic, and 5.64% in Gabon (figure 11). However, during the period 2010-2015, the travel sector was the one which displays the largest average growth in Cameroon and the Congo Republic, accounting for 25.02% per annum and 8.98% per annum, respectively. While in Gabon, computer, communication and other display the biggest average growth at 9.81% per annum (table 1).

Regarding export flows of the various sub-category of service, the composition is not homogenous across CEMAC countries. In Cameroon services export is driven by three out of the four sub-sectors of services: transport (32.25%), travel (31.22%) and computer,

[1] Data on sub-category of services in available only in three CEMAC countries: Cameroon, Congo Republic, and Gabon.

communication and other services (30.95%) in 2015. While computer, communication and other services is the major composition of services export of Gabon and the Congo Republic, accounting for 83.75% and 67.86%, respectively in 2015. Insurance and financial services is the less component of services export of three countries, accounting for 5.58% in Cameroon, 1.6% in the Congo Republic, and 1.15% in Gabon (figure 12). During the period 2010-2015, travel services displays the largest average growth in Cameroon and Congo Republic, accounting for 23.07% per annum and 10.88% per annum, respectively. While in Gabon only computer, communication and other services displays a positive growth, on average at 0.77% per annum (table 2).

***Figure 11** : Share of various commercial services import by some CEMAC countries (%)*



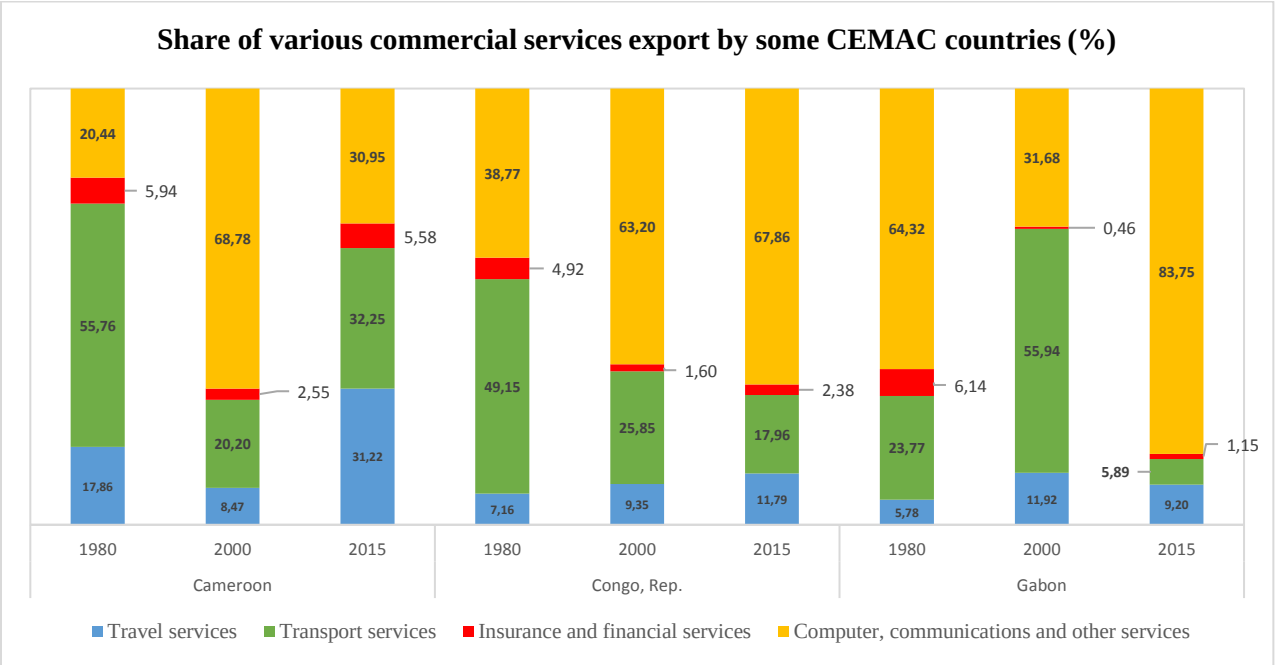
***Source** : Author's calculation with WDI data*

***Table 1** : Average various services import growth rate for some CEMAC country (%)*

		1980-1989	1990-1999	2000-2009	2010-2015
Cameroon	Travel services	16.31	-6.57	7.36	25.02
	Transport services	1.03	-6.93	10.68	8
	Insurance and financial services	1.38	-5.6	16.09	5.42
	Computer, communications and other services	0.27	3.19	4.65	-8.53
Congo, Republic	Travel services	12.75	-6.33	25.28	8.96
	Transport services	0.02	-3.77	27.39	0.48
	Insurance and financial services	-4.1	11.09	20.68	-2.45
	Computer, communications and other services	-1.97	3.54	14.79	2.49
Gabon	Travel services	2.84	-4.41	17.56	-9.17
	Transport services	1.48	2.59	7.24	-2.77
	Insurance and financial services	-0.4	4.83	6.24	-0.8
	Computer, communications and other services	1.2	-4.04	5	9.81

Source : Author's calculation with WDI data

***Figure 12** : Share of various commercial services export by some CEMAC countries (%)*



***Source** : Author's calculation with WDI data*

***Table 2** : Average various services export growth rate for some CEMAC country (%)*

		1980-1989	1990-1999	2000-2009	2010-2015
Cameroon	Travel services	4.72	1.39	18.77	23.07
	Transport services	-1.1	-5.18	15.24	-0.57
	Insurance and financial services	6.77	-15.18	14.98	10.28
	Computer, communications and other services	8.58	8.29	-4.07	-4.21
Congo, Republic	Travel services	-0.3	4.46	22.77	10.88
	Transport services	-2.72	-1.59	12.36	-7.66
	Insurance and financial services	-33.74	34.56	36.72	0.53
	Computer, communications and other services	-4.83	17.86	10.11	1.05
Gabon	Travel services	-14.97	19.08	2.89	-21.82
	Transport services	1.19	8.69	-9.67	-12.72
	Insurance and financial services	-6.32	0.15	69.13	-48.27
	Computer, communications and other services	-0.89	-6.48	-3.58	0.77

***Source** : Author's calculation with WDI data*

4. Data and methodology

This section has two objectives: (3.1) describes the data used and (3.2). sets up the methodology used to estimate the impact of trade in services on economic growth.

4.1. Data

Data are collected on six (06) CEMAC countries, namely Cameroon, Central African Republic, Chad, Congo, Equatorial Guinea, and Gabon over the period 1987 – 2015. Data come from various sources, table 3 below describes all varibles and sources.

Table 3 : Data description and sources

Variable	Description	Source
GDP	Gross Domestic Product	World Development Indicator (WDI)
EXSERV	Service export	United Nations Conference on Trade and Development (UNCTAD) and the United Nations Commodity Trade Statistics Database (UN Comtrade)
IMSER	Service import	UNCTAD and UN Comtrade
GFCF	Gross fixed capital formation	WDI
GOVEX	Government expenditure	WDI
INF	Inflation rate	WDI

***Source**: The author.*

We take the natural logarithm of all variables to avoid the influence of extreme values. The stationary test in annex 2 shows that all variables are stationary in the first difference. The descriptive statistics in annex 3 reveals a linear and positive significant relation between economic growth and service import, gross fixed capital formation, and government expenditure. It also shows a linear and negative significant relationship between economic growth and inflation. While we observe a weak linear and significant relationship between economic growth and services export. We are going to put all these variables in an econometric model to see their conjoint effect on economic growth.

4.2. Methodology

To investigate the impact of trade in services on economic growth in CEMAC countries, we constructed the model based on Li, Greenaway, and Hine (2003), Gabriele (2006), Mishra, Lundstrom, and Anand (2011), and Sermcheep (2019).

The main outcome variable is economic growth which is measured as a change in GDP.

The main explanatory variable is trade in services especially service import and service export by each CEMAC country. Our contribution is to jointly investigate the effect of both services imports and service exports on economic growth.

The control variables which we help us to check the robustness of our results are choosing base on growth literature are: Gross fixed capital formation (GFCF), Government expenditure (GOVEX), and Inflation rate (INF).

Since we work with panel data, the first thing to do is to check the homogeneous or heterogeneous specification of the data generating process. Specification test in annex 4 reveals that the Fisher test does not confirm the fixed effect, Breusch and Pagan test also does not confirm random effect and the Hausman test does not reject the absence of correlation between the error term and explanatory variables. Since the p-value of the Hausman test is more than 10%, it does not allow us to differentiate between the fixed effect model and the random effect model. In this situation, we refer to variance decomposition of all variables to see which effect dominates. Variance decomposition in annex 4 reveals that the intra-individual variation of all variables is greater than the inter-individual variation, so the fixed-effect model is the most appropriate since heterogeneity intra-individual is larger than heterogeneity inter-individual. We also test the presence of time fixed effect, the result of the temporal effect test in annex 4 confirms the presence of time fixed effect on data. So, the data generating process is heterogenous at the country and temporal level.

Our model is the following:

$$\boldsymbol{d}(\ln(\boldsymbol{GDP_{it}})) = \boldsymbol{\beta_0} + \boldsymbol{\beta_1 d}(\ln(\boldsymbol{IMSERV_{it}})) + \boldsymbol{\beta_2 d}(\ln(\boldsymbol{EXSERV_{it}})) + \boldsymbol{\gamma' X_{it}} + \mu_i + \boldsymbol{\alpha_t} + \boldsymbol{\varepsilon_{it}}$$

Where d is first difference operator; ln is the natural logarithm; i is the country index, t is time index; GDP_{it} is the Gross Domestic Product of country i at time t; $IMSERV_{it}$ service import by country i at time t; $EXSERV_{it}$ service export by country i at time t; X_{it} is a vector which contents all the control variables; α_t is the ime fixed effect; μ_i is the country fixed effect, and ε_{it} is an error term.

$X_{it} = (d(\ln(GFCF_{it})), d(\ln(GOVEX_{it})), d(\ln(100+INF_{it}))'$ is a vector of dimension (3, 1).

$\gamma = (\gamma_1, \gamma_2, \gamma_3)'$ is a vector of dimension (3, 1).

The summary of the expected effect according to the descriptive statistics is in table 4 below.

Table 4 : Expected effect of explanatory variables

Parameter	Expected effect
β_1	Positive
β_2	Positive
γ_1	Positive
γ_2	Positive
γ_3	Negative

***Source**: The author.*

5. Empirical results

This section has the objective to assess the impact of trade in services on economic growth. Table 5 presents the results of estimation without considering time fixed effect. The first column investigates the relationship between service export and economic growth. I find a positive effect of service export on economic growth; however, this effect is statistically insignificant. The second column checks the relationship between service import and economic growth. I find a positive and significant effect of service import on economic growth. An increase of service import by one percentage point leads to an increase in economic growth by about 0.34 percentage point. Column three examines the impact of both service import and export on economic growth, their impact remains positive but decrease slightly in magnitude; however, service import has significant impact while service export remains insignificant. From column four to six, I gradually introduce a set of control variables to check the robustness of the model. I find that the impact of service import on economic growth remains positive and significant but decrease a bit in magnitude, while the impact of service export on economic growth becomes negative and insignificant. The other two determinants of economic growth gross fixed capital formation and government expenditure have a strong positive and significant impact on economic growth in CEMAC economies. An increase in gross fixed capital formation and government expenditure by one percentage point increase economic growth by 0.179 and 0.317 percentage point respectively, while inflation has a negative and insignificant effect on economic growth.

Table 5 : Estimation without time fixed effect

Estimation without time fixed effect						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
EXSERV_d	**0.0512**		**0.0336**	**-0.0254**	**-0.0137**	**-0.0128**
	(0.0329)		(0.0300)	(0.0360)	(0.0328)	(0.0326)
IMSERV_d		**0.348*** **	**0.341*** **	**0.220*** **	**0.174*** **	**0.175*** **
		(0.0573)	(0.0575)	(0.0668)	(0.0614)	(0.0612)
GFCF_d				**0.244*** **	**0.186*** **	**0.179*** **
				(0.0512)	(0.0477)	(0.0496)
GOVEX_d					**0.318*** **	**0.317*** **
					(0.0578)	(0.0626)
INF_d						**-0.151**
						(0.124)
Constant	**0.0640*** **	**0.0450*** **	**0.0435*** **	**0.0209**	**0.0114**	**0.0126**
	(0.0150)	(0.0140)	(0.0141)	(0.0128)	(0.0118)	(0.0118)
Observations	168	168	168	150	150	147
R-squared	0.015	0.186	0.192	0.293	0.419	0.435
Number of CountryID	6	6	6	6	6	6

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

***Source**: The author.*

When we incorporate the time fixed effect in the regression, the results in table 6 shows that the impact of services import is considerably reduced by more than half. This estimate becomes negative and insignificant when the control variables are introduced; while the impact of service export remains quite similar and insignificant. The impact of control variables gross fixed capital formation and government expenditure remains positive and significant with the same magnitude for gross fixed capital formation and a reduction by more than half for government expenditure, while the effect of inflation remains insignificant but becomes positive.

The reduction of the magnitude of the impact of explanatory variables on economic growth is capture by temporal effect where some of period time (1994, 2009 and 2015) are strongly significant for all the model specifications (see annex 5). It points out the negative and significant impact of the devaluation of Franc CFA in 1994 on economic growth in CEMAC economies by about 0.3 percentage point; the negative significant impact of 2008 financial crisis which contribute to a decrease of economic growth by about 0.2 percentage point in 2009, and the negative a significant impact of the negative oil price shock in 2014 which contribute to a decrease of economic growth by about 0.3 percentage point in 2015, since CEMAC countries mainly depend on oil prices.

Table 6 : Estimation with temporal fixed effect

Estimation with temporal fixed effect						
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
EXSERV_d	**0.0363**		**0.0282**	**-0.0268**	**-0.0231**	**-0.0223**
	(0.0261)		(0.0258)	(0.0299)	(0.0295)	(0.0297)
IMSERV_d		**0.139*** **	**0.132** **	**-0.0214**	**-0.0115**	**-0.0132**
		(0.0527)	(0.0531)	(0.0592)	(0.0583)	(0.0586)
GFCF_d				**0.206*** **	**0.185*** **	**0.167*** **
				(0.0453)	(0.0455)	(0.0472)
GOVEX_d					**0.135** **	**0.164** **
					(0.0601)	(0.0642)
INF_d						**0.119**
						(0.167)
Constant	**0.0796**	**0.0784**	**0.0756**	**0.0916***	**0.0942***	**0.0935***
	(0.0583)	(0.0573)	(0.0573)	(0.0507)	(0.0499)	(0.0498)
Time fixed effect	**YES**	**YES**	**YES**	**YES**	**YES**	**YES**
Observations	168	168	168	150	150	147
R-squared	0.554	0.569	0.573	0.673	0.687	0.694
Number of CountryID	6	6	6	6	6	6
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

***Source**: The author.*

Our findings of the impact of trade in services (services import and services export) on economic growth are not consistent since when I include time fixed effect on the regression, the coefficient of services import is not stable for all the specifications. Also, the coefficient of services export is not significant in both specifications (with and without the time fixed effect). So, trade in services has no impact on economic growth in CEMAC countries.

6. Conclusion

At the end of this paper whose objective was to study the effect of trade in services on developing countries, and more specifically its impact on the economic growth of CEMAC countries. To do so, I have explored the empirical literature on trade in services. First, I explore the effects of trade in services on employment, second its effects on economic growth, and third I explore the interaction between trade in services and trade in goods. For empirical analysis, I have focused solely on the effect of trade in services on economic growth. I constructed an econometric model to investigate the impact of trade in services on economic growth. Trade in services is measured by service import and service export while economic growth measured by the change in gross domestic product. We used an unbalanced panel data over the period 1987-2015.

Before estimating the econometric model, I study first the stylized facts on trade in services in CEMAC economies in other to have an idea on the structure and the performance of the services sector in that region. These stylized facts on trade in services revealed that CEMAC economies are a net importer of services. Services import in value increased by about five times, while services export in value increased by about four times over the period 1987-2015. The share of services export in CEMAC GDP increased slightly from 3.21% to 3.36% during the period 1987-2015, while the share of services import in CEMAC GDP increased from 13.4% to 16.42% during the same period. The CEMAC's share in world services export and world services import decreased from 0.11% to 0.005% and 0.46% to 0.26% respectively, during the period 1987-2015.

Regarding trade flows, amongst the CEMAC countries, Cameroon is the largest services importer of this region, his imports account for 51.34% of total CEMAC services import in 2015. Other major services importers in the region are Congo and Chad which accounts for about 13.55%, and 12.40%, respectively. Concerning, services export, the Congo Republic is the biggest services exporter from this region, its exports account for 28.42% of total CEMAC's services export in 2015. Other dominant services exporter are Chad, Equatorial Guinea, and Cameroun and their flows account for 21.11%, 13.66%, and 16.80% respectively. The Central African Republic is the one which contributes less both in service export (1.65%) and services import (3.94%) in this region.

Concerning export flows of the various sub-category of service, the composition is not homogenous across CEMAC countries. In Cameroon services export is driven by three out of the four sub-sectors of services: transport (32.25%), travel (31.22%) and computer, communication, and other services (30.95%) in 2015. While computer, communication and other services is the major composition of services export of Gabon and Congo Republic, accounting for 83.75% and 67.86%, respectively in 2015. Insurance and financial services are the smallest component of services export of three countries, accounting for 5.58% in Cameroon, 1.6% in the Congo Republic, and 1.15% in Gabon. Regarding import, out of the four sub-categories of commercial services, transport represents the largest share of import in Cameroon, accounting for 42.34%, while computer, communication, and other services represent the largest one in the Congo Republic and Gabon accounting for 67.83% and 50.64%, respectively in 2015. Insurance and financial services are the residual components of services import of three countries, accounting for 7.41% in Cameroon, 3.53% in the Congo Republic, and 5.64% in Gabon.

Empirical results suggest no consistent impact of services import and services export on economic growth, their coefficient is not stable for all the specification when we consider time fixed effect on the regression. Only traditional determinants of economic growth gross fixed capital formation and government expenditure have a consistent positive impact on economic growth. The services export-led economy growth is not held for the CEMAC countries. The results also pointed out the stronger negative effect of period (1994, 2009, and 2015) on economic growth. All these are related to specific shocks faced by CEMAC countries, which are respectively the devaluation of Franc CFA, the 2008-2009 financial crisis, and the negative oil price shock.

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Annexes

Annex 1 : definition of sub-category of service

Sub-category of service	Definition
Travel services	Covers goods and services acquired from an economy by travelers for their own use during visits of less than one year in that economy for either business or personal purposes. Travel includes local transport (i.e., transport within the economy being visited and provided by a resident of that economy) but excludes international transport (which is included in passenger transport. Travel also excludes goods for resale, which are included in general merchandise.
Transport services	Covers all transport services (sea, air, land, internal waterway, pipeline, space and electricity transmission) performed by residents of one economy for those of another and involving the carriage of passengers, the movement of goods (freight), rental of carriers with crew, and related support and auxiliary services. Also included are postal and courier services. Excluded are freight insurance (included in insurance services); goods procured in ports by nonresident carriers (included in goods); maintenance and repairs on transport equipment (included in maintenance and repair services n.i.e.); and repairs of railway facilities, harbors, and airfield facilities (included in construction).
Insurance and financial services	Cover various types of insurance provided to nonresidents by resident insurance enterprises and vice versa, and financial intermediary and auxiliary services (except those of insurance enterprises and pension funds) exchanged between residents and nonresidents.
Computer, communications and other services	Include such activities as international telecommunications, and postal and courier services; computer data; news-related service transactions between residents and nonresidents; construction services; royalties and license fees; miscellaneous business, professional, and technical services; and personal, cultural, and recreational services.

Source: World Bank

Annex 2: Stationary test

2.1. Stationary test at level

Variable	Description	P-value	Decision
GDP_Ln	Logarithm of Gross Domestic product	0.9902	No
EXSERV_Ln	Logarithm of Service export	0.6846	No
IMSER_Ln	Logarithm of Service import	0.9756	No
GFCF_Ln	Logarithm of Gross fixed capital formation	0.9521	No
GOVEX_Ln	Logarithm of Government expenditure	0.9086	No
INF_Ln	Logarithm of Inflation rate	0.1000	No

Source: The author.

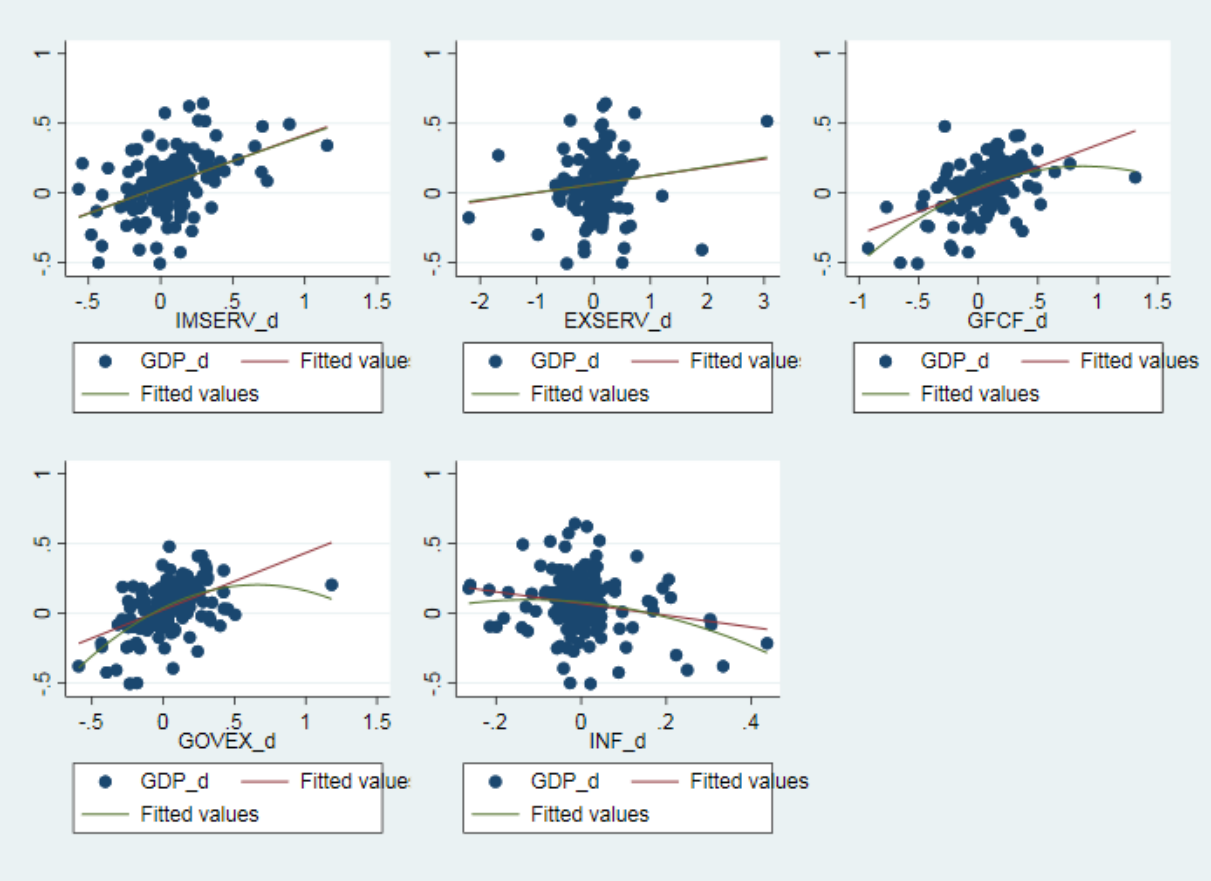
2.2. Stationary test at first difference

Variable	Description	P-value	Decision
GDP_d	First difference of logarithm of Gross Domestic product	0.0000	Yes
EXSERV_d	First difference of logarithm of Service export	0.0000	Yes
IMSER_d	First difference of logarithm of Service import	0.0000	Yes
GFCF_d	First difference of logarithm of Gross fixed capital formation	0.0000	Yes
GOVEX_d	First difference of logarithm of Government expenditure	0.0000	Yes
INF_d	First difference of logarithm of inflation	0.0000	Yes

Source: The author.

Annex 3: Descriptive statistics

3.1. Link between GDP_d and EXSERV_d, IMSERV_d, GFCF_d, INF



Source: The author.

3.2. Correlation matrix

	GDP_d	EXSERV_d	IMSERV_d	GFCF_d	GOVEX_d	INF
GDP_d	1					
EXSERV_d	0.1384*	1				
IMSERV_d	0.4557***	0.1109	1			
GFCF_d	0.4947***	-0.1048	0.4218***	1		
GOVEX_d	0.4976****	-0.0387	0.2494***	0.2798***	1	
INF_Ln	-0.2009***	-0.0529	-0.0988	0.0990	-0.2641***	1

Source: The author.

Note: *** and * means significance at 1% and 10% level respectively.

Annex 4: Specification test

4.1. Fisher test

Fixed-effects (within) regression — Number of obs = 147
Group variable: CountryID — Number of groups = 6

R-sq:
within = 0.4350
between = 0.2468
overall = 0.4328

Obs per group:
min = 10
avg = 24.5
max = 28

F(5,136) = 20.94
corr(u_i, Xb) = -0.0853 — Prob > F = 0.0000

GDP_d	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
EXSERV_d	-.0127602	.0325687	-0.39	0.696	-.0771667	.0516464
IMSERV_d	.1753742	.0611608	2.87	0.005	.054425	.2963235
GFCF_d	.1789307	.0496191	3.61	0.000	.0808059	.2770556
GOVEX_d	.3169377	.0626189	5.06	0.000	.193105	.4407705
INF_d	-.1514679	.1243356	-1.22	0.225	-.3973491	.0944133
_cons	.01265	.011796	1.07	0.285	-.0106773	.0359773
sigma_u	.02803494					
sigma_e	.13442629					
rho	.04168125	(fraction of variance due to u_i)				

F test that all u_i=0: F(5, 136) = 0.51 — Prob > F = 0.7686

Source: *The author.*

4.2. Breusch Pagan test

Breusch and Pagan Lagrangian multiplier test for random effects

GDP_d[CountryID,t] = Xb + u[CountryID] + e[CountryID,t]

Estimated results:

	Var	sd = sqrt(Var)
GDP_d	.0302893	.1740381
e	.0180704	.1344263
u	0	0

Test: Var(u) = 0
chibar2(01) = 0.00
Prob > chibar2 = 1.0000

Source: *The author.*

2.4. Hausman test

	Coefficients (b) Fixed_Effect	(B) Random_Eff~t	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
EXSERV_d	-.0127602	-.0169167	.0041565	.0056807
IMSERV_d	.1753742	.1751243	.0002499	.0101955
GFCF_d	.1789307	.1929081	-.0139774	.0114861
GOVEX_d	.3169377	.2893851	.0275526	.0211745
INF_d	-.1514679	-.1698103	.0183425	.0205767

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 1.87
Prob>chi2 = 0.8674

***Source**: The author.*

4.4. Variance decomposition of variables

Variable		Mean	Std. Dev.	Min	Max	Observations
GDP_d	overall	0.0669613	0.1986	-0.5054	0.6433	N = 168
	between		0.0583	0.0123	0.1768	n = 6
	within		0.1913	-0.6101	0.5335	T-bar = 28
EXSERV_d	overall	0.0571705	0.4570	-2.1986	3.0533	N = 168
	between		0.0413	0.0192	0.1363	n = 6
	within		0.4554	-2.2777	2.9742	T-bar = 28
IMSERV_d	overall	0.0631191	0.2417	-0.5686	1.1542	N = 168
	between		0.0500	0.0120	0.1443	n = 6
	within		0.2374	-0.6239	1.0731	T-bar = 28
GFCF_d	overall	0.0597811	0.2687	-0.9233	1.3159	N = 150
	between		0.0456	0.0014	0.1323	n = 6
	within		0.2658	-0.8926	1.3466	T-bar = 25
GOVEX_d	overall	0.0462707	0.2120	-0.5936	1.1825	N = 150
	between		0.0924	0.0063	0.2553	n = 6
	within		0.2041	-0.5806	0.9734	T-bar = 25
INF_d	overall	0.0038481	0.0943	-0.2637	0.4367	N = 165
	between		0.0058	-0.0034	0.0138	n = 6
	within		0.0942	-0.2631	0.4371	T-bar = 27.5

Source: The author.

4.5. Temporal effect test

```
( 1)  1989.Time = 0
( 2)  1990.Time = 0
( 3)  1991.Time = 0
( 4)  1992.Time = 0
( 5)  1993.Time = 0
( 6)  1994.Time = 0
( 7)  1995.Time = 0
( 8)  1996.Time = 0
( 9)  1997.Time = 0
(10)  1998.Time = 0
(11)  1999.Time = 0
(12)  2000.Time = 0
(13)  2001.Time = 0
(14)  2002.Time = 0
(15)  2003.Time = 0
(16)  2004.Time = 0
(17)  2005.Time = 0
(18)  2006.Time = 0
(19)  2007.Time = 0
(20)  2008.Time = 0
(21)  2009.Time = 0
(22)  2010.Time = 0
(23)  2011.Time = 0
(24)  2012.Time = 0
(25)  2013.Time = 0
(26)  2014.Time = 0
(27)  2015.Time = 0

      F( 27,   109) =    3.41
           Prob > F =    0.0000
```

***Source**: The author.*

Annex 5: Estimation with time fixed effect

Estimation with time fixed effect						
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
EXSERV_d	**0.0363**		**0.0282**	**-0.0268**	**-0.0231**	**-0.0223**
	(0.0261)		(0.0258)	(0.0299)	(0.0295)	(0.0297)
IMSERV_d		**0.139*** **	**0.132** **	**-0.0214**	**-0.0115**	**-0.0132**
		(0.0527)	(0.0531)	(0.0592)	(0.0583)	(0.0586)
GFCF_d				**0.206*** **	**0.185*** **	**0.167*** **
				(0.0453)	(0.0455)	(0.0472)
GOVEX_d					**0.135** **	**0.164** **
					(0.0601)	(0.0642)
INF_d						**0.119**
						(0.167)
1989.Time	**-0.101**	**-0.0920**	**-0.0887**	**-0.0685**	**-0.0682**	**-0.0674**
	(0.0825)	(0.0811)	(0.0811)	(0.0718)	(0.0706)	(0.0704)
1990.Time	**0.107**	**0.0828**	**0.0897**	**0.0532**	**0.0359**	**0.0334**

Estimation with time fixed effect						
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	(0.0826)	(0.0812)	(0.0813)	(0.0723)	(0.0714)	(0.0712)
1991.Time	**-0.0787**	**-0.0729**	**-0.0704**	**-0.102**	**-0.115**	**-0.111**
	(0.0824)	(0.0810)	(0.0810)	(0.0718)	(0.0708)	(0.0713)
1992.Time	**-0.0376**	**-0.0332**	**-0.0293**	**-0.0794**	**-0.0872**	**-0.0868**
	(0.0825)	(0.0810)	(0.0810)	(0.0718)	(0.0707)	(0.0706)
1993.Time	**-0.199****	**-0.196****	**-0.195****	**-0.227*****	**-0.216*****	**-0.214*****
	(0.0824)	(0.0809)	(0.0809)	(0.0714)	(0.0704)	(0.0702)
1994.Time	**-0.322*****	**-0.287*****	**-0.289*****	**-0.320*****	**-0.270*****	**-0.297*****
	(0.0824)	(0.0819)	(0.0819)	(0.0726)	(0.0747)	(0.0918)
1995.Time	**0.104**	**0.0728**	**0.0817**	**0.0224**	**0.0182**	**0.0442**
	(0.0827)	(0.0813)	(0.0817)	(0.0724)	(0.0712)	(0.0801)
1996.Time	**0.0687**	**0.0309**	**0.0339**	**0.00753**	**-0.00428**	**0.000473**
	(0.0824)	(0.0821)	(0.0821)	(0.0724)	(0.0713)	(0.0719)
1997.Time	**-0.0147**	**-0.0146**	**-0.0136**	**-0.133***	**-0.134***	**-0.124**
	(0.0824)	(0.0809)	(0.0809)	(0.0715)	(0.0702)	(0.0750)
1998.Time	**-0.132**	**-0.152***	**-0.138***	**-0.134***	**-0.140****	**-0.110**
	(0.0833)	(0.0809)	(0.0818)	(0.0715)	(0.0703)	(0.0748)
1999.Time	**0.0197**	**0.0432**	**0.0320**	**-0.0748**	**-0.0795**	**-0.119**
	(0.0830)	(0.0810)	(0.0816)	(0.0720)	(0.0708)	(0.0759)
2000.Time	**0.0294**	**0.0127**	**0.0204**	**-0.0591**	**-0.0551**	**-0.0567**
	(0.0827)	(0.0810)	(0.0812)	(0.0720)	(0.0707)	(0.0705)
2001.Time	**-0.00933**	**-0.0250**	**-0.0235**	**-0.109**	**-0.129***	**-0.133***
	(0.0824)	(0.0811)	(0.0811)	(0.0720)	(0.0713)	(0.0711)
2002.Time	**0.0326**	**0.0246**	**0.0284**	**-0.0318**	**-0.0538**	**-0.0526**
	(0.0825)	(0.0809)	(0.0809)	(0.0726)	(0.0720)	(0.0721)
2003.Time	**0.143***	**0.139***	**0.140***	**0.106**	**0.0836**	**0.0838**
	(0.0824)	(0.0809)	(0.0809)	(0.0715)	(0.0710)	(0.0710)
2004.Time	**0.210****	**0.190****	**0.186****	**0.155****	**0.133***	**0.134***
	(0.0825)	(0.0816)	(0.0816)	(0.0729)	(0.0722)	(0.0723)
2005.Time	**0.183****	**0.175****	**0.176****	**0.0625**	**0.0543**	**0.0512**
	(0.0824)	(0.0810)	(0.0809)	(0.0720)	(0.0709)	(0.0708)
2006.Time	**0.0487**	**0.0319**	**0.0329**	**0.0208**	**-0.0167**	**-0.0222**
	(0.0824)	(0.0812)	(0.0811)	(0.0692)	(0.0700)	(0.0700)
2007.Time	**0.0754**	**0.0611**	**0.0593**	**0.0389**	**0.00796**	**0.0108**
	(0.0824)	(0.0812)	(0.0812)	(0.0694)	(0.0696)	(0.0701)
2008.Time	**0.162***	**0.142***	**0.142***	**0.105**	**0.0834**	**0.0768**
	(0.0824)	(0.0813)	(0.0813)	(0.0699)	(0.0694)	(0.0695)
2009.Time	**-0.220*****	**-0.205****	**-0.205****	**-0.249*****	**-0.252*****	**-0.248*****
	(0.0824)	(0.0812)	(0.0811)	(0.0692)	(0.0680)	(0.0680)
2010.Time	**0.0308**	**0.00795**	**0.0118**	**-0.00523**	**-0.0109**	**-0.00525**
	(0.0824)	(0.0812)	(0.0813)	(0.0695)	(0.0683)	(0.0686)
2011.Time	**0.0895**	**0.0780**	**0.0755**	**0.0666**	**0.0461**	**0.0455**
	(0.0825)	(0.0811)	(0.0811)	(0.0692)	(0.0686)	(0.0684)
2012.Time	**-0.0789**	**-0.0858**	**-0.0793**	**-0.100**	**-0.121***	**-0.129***
	(0.0826)	(0.0809)	(0.0811)	(0.0692)	(0.0686)	(0.0686)
2013.Time	**-0.129**	**-0.113**	**-0.122**	**-0.0838**	**-0.103**	**-0.104**
	(0.0827)	(0.0809)	(0.0813)	(0.0693)	(0.0686)	(0.0687)
2014.Time	**-0.0279**	**-0.0431**	**-0.0372**	**-0.118***	**-0.111**	**-0.108**

Estimation with time fixed effect						
VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	(0.0825)	(0.0810)	(0.0811)	(0.0706)	(0.0694)	(0.0693)
2015.Time	**-0.366*** **	**-0.337*** **	**-0.337*** **	**-0.304*** **	**-0.280*** **	**-0.280*** **
	(0.0824)	(0.0818)	(0.0818)	(0.0708)	(0.0704)	(0.0702)
Constant	**0.0796**	**0.0784**	**0.0756**	**0.0916***	**0.0942***	**0.0935***
	(0.0583)	(0.0573)	(0.0573)	(0.0507)	(0.0499)	(0.0498)
Observations	168	168	168	150	150	147
R-squared	0.554	0.569	0.573	0.673	0.687	0.694
Number of CountryID	6	6	6	6	6	6
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1						

***Source**: The author.*

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